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Published in:
Nota Lepidopterologica

Publication date:
2013

Document version
Publisher's PDF, also known as Version of record

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Citation for published version (APA):
Bidzilya, O. V., & Karsholt, O. (2013). Two little-known species of Gelechiidae in the European fauna. *Nota Lepidopterologica*, 36(1), 77-84. <https://biodiversitylibrary.org/page/46987182>

Two little-known species of Gelechiidae in the European fauna

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Received 13 April 2013; reviews returned 22 April 2013; accepted 30 April 2013.

Subject Editor: Lauri Kaila.

Abstract. The identities of *Doryphora orthogonella* Staudinger, 1871 and *Anacampsis azosterella* Herrich-Schäffer, 1854 are discussed and they are confirmed as belonging to the genera *Stomopteryx* Heinemann, 1870 and *Syncopacma* Meyrick, 1925, respectively. Both species are redescribed based on types and additional new material. The adults and the male genitalia of both species are illustrated. A lectotype of *Doryphora orthogonella* is designated. Both species are new to the fauna of Ukraine, and *Syncopacma azosterella* is shown to be relatively widely distributed in southern parts of central and eastern Europe and in the Mediterranean.

Introduction

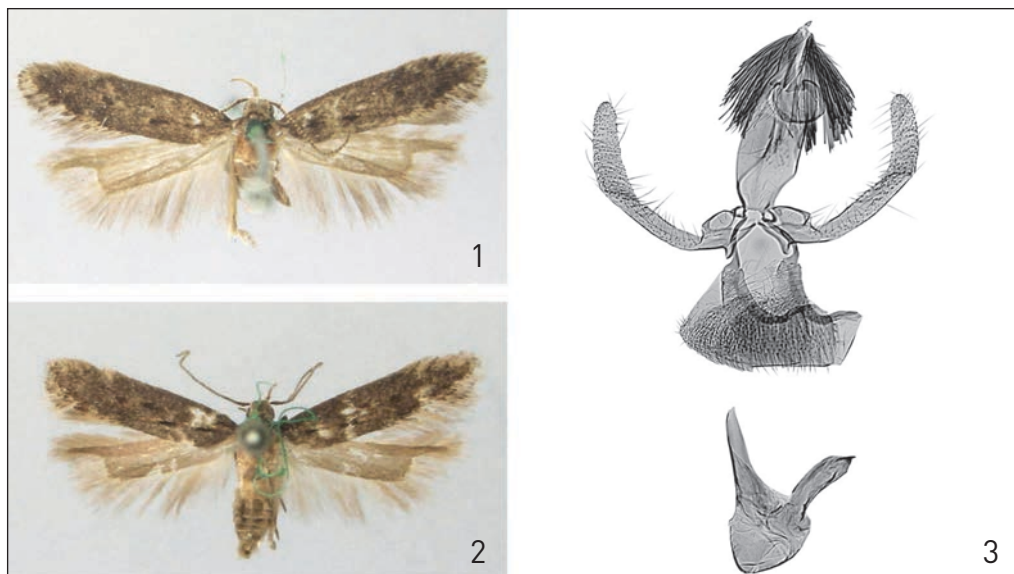
Gelechiidae is among the least known lepidopteran families in Europe (Bidzilya & Karsholt 2008). Although some progress has been made (e.g., Huemer & Karsholt 2010), there are still numerous taxa awaiting revision. Here we deal with two such taxa. As a result of study of material deposited at ZMKU two doubtful species of Gelechiidae belonging to the genera *Stomopteryx* Heinemann, 1870 and *Syncopacma* Meyrick, 1925, currently in the subfamily Anacampsinae (Karsholt et al. 2013), were found. Their identification appeared problematic, and we therefore considered them worthy of detailed examination.

The first species, *Stomopteryx orthogonella* (Staudinger, 1871), was known only from the type-series collected in Sarepta in Russia (nowadays a district of Volgograd) in 1871 and has not been recorded since its description. The discovery of two additional males of this species from Ukraine encouraged us to re-examine the type material deposited in the collection of ZMHU. As a result, *S. orthogonella* is redescribed here and its male genitalia are described and illustrated for the first time.

The second species, *Syncopacma azosterella* (Herrich-Schäffer, 1854), has for a long time been confused with other species of the genus *Syncopacma*. This was due to the fact that its type material had not been previously revised. Recently the holotype of *S. azosterella* was found by the second author, and this allowed us to clarify the status of this taxon and link a number of regional records with this name.

Abbreviations of institutions

BMNH	The Natural History Museum, London, U.K.
ZMHU	Zoological Museum, Humboldt University, Berlin, Germany
ZMKU	Zoological Museum, Kiev National Taras Shevchenko University, Kiev, Ukraine
ZMUC	Zoological Museum, Natural History Museum of Denmark, Copenhagen, Denmark



Figs 1–3. *Stomopteryx orthogonella* (Staudinger). **1.** Lectotype, Sarepta, wingspan 14.0 mm. **2.** Paralectotype, Sarepta, wingspan 13.1 mm. **3.** Male genitalia, lectotype.

Stomopteryx orthogonella (Staudinger, 1871)

Figs 1–3

Doryphora orthogonella Staudinger, 1871: 307.

Aristotelia orthogonella (Staudinger); Meyrick, 1925: 42.

Stomopteryx orthogonella (Staudinger); Karsholt & Riedl, 1996: 118, 311.

Material. Lectotype by present designation ♂, “Origin” | “Sarepta” | *Stomopteryx orthogonella* Stdgr., O. Karsholt det. | Gen. Præp. nr. 3025, ♂, O. Karsholt | Zool. Mus. Berlin | ex. coll. Staudinger (here designated). – Paralectotype: ♂, “Origin” | “Sarepta” (ZMHU). **Russia:** Sarepta, 2♂ 25–30.v.1864 (Christoph), 1♂ 1867, 1♂ 6.viii.1869, 1♂ 8.viii.1875 (all BMNH); Volgograd, 1♂ 18–24.v.1967, leg. V. Zouhar, genitalia slide Karsholt 4076 (ZMUC). **Ukraine,** Dnepropetrovsk reg., Pavlograd distr., Bulakhovka, estuary, saline: 2♂ 15.vii.2011, leg. V. Afans’eva (ZMKU).

Redescription. Adult (Figs 1, 2). Wingspan 12.5–14.5 mm. Head grey to light brown; frons and lateral margins paler; labial palpus strongly upcurved, brown, inner surface pale grey to cream; segment 3 paler, 1.5 times narrower and nearly as long as segment 2, pointed; scapus brown, flagellum brown with white basal rings; thorax and tegula as forewing. Forewing brown; a narrow black streak from the base along fold to nearly half length of wing, with a few orange-brown scales; a diffuse black spot in middle of cell; a black dot in the cell corner; creamy spots at 3/4 of costa and dorsum; subapical area mottled with grey scales; fringe grey, brown-tipped. Hindwing grey; a narrow yellow-white line at border to grey fringe.

Variation. The black streak at the base of the forewing may be divided into two elongated spots; the costal and dorsal cream-coloured spots may in some specimens be reduced to a few scales or obsolete.

Male genitalia (Fig. 3). Uncus 3 times as long as broad, densely covered with long strong setae, tip pointed, curved; gnathos weak, ring-shaped; tegumen prolonged, lateral

folds curved inwards; pedunculi short, tapered; valva evenly curved, slightly broadened in middle, apex rounded, about as long as tegumen and uncus, covered with setae in distal 2/3; sacculus subtriangular, densely covered with hairs; phallus basally swollen, distal portion straight, gradually narrowed and pointed apically; lateral projection about as broad as distal portion of the phallus at its base, with a prominent pointed tip.

Female genitalia. Unknown.

Biology. Early stages unknown. Adults have been collected in May, July and August, and the species may thus be bivoltine. The habitat in Ukraine is a saline estuary.

Distribution. Russia: Lower Volga; Ukraine (new record).

Remarks. *Doryphora orthogonella* was described from two males collected at Sarepta (now Krasnoarmeysk near Volgograd, 48°31'N, 44°34'E) by H. Christoph (Staudinger 1871). Although Staudinger compared it to *Scrobipalpa acuminatella* (Sircom, 1850) he noted that its hindwings were similar to those of *Gelechia detersella* Zeller, 1847, the type species of the genus *Stomopteryx* Heinemann, 1870. It was, however, only combined with *Stomopteryx* in 1996 by Karsholt & Riedl.

The five specimens held in the collection of the BMNH have also most likely been collected at the type locality, although they are not part of the type series. The few specimens of *S. orthogonella* available from the type locality and two specimens collected in Ukraine are identical both externally and in the male genitalia.

Externally *S. orthogonella* may resemble *S. hungaricella* Gozmány, 1957, but the latter is usually nearly uniformly black rather than brown, and without any trace of streaks or spots. The lateral projection that is placed near the right angle of the phallus is the most prominent character; it separates *S. orthogonella* from most other species of *Stomopteryx*, although a similar structure is found in *S. basalis* (Staudinger, 1876) and related species, which are easily separated by the reddish-brown base of the forewing.

S. orthogonella is apparently a rare species. Since its description in 1871 it has not been dealt with in the literature apart from checklists and catalogues (e.g., Meyrick 1925) until now. Anikin et al. (1999) considered it to be extinct from its type locality.

Syncopacma azosterella (Herrich-Schäffer, 1854)

Figs 4–8

Anacamptis azosterella Herrich-Schäffer, 1854: 194

Syncopacma azosterella (Herrich-Schäffer, 1854) – Gozmány, 1957: 121, fig. 4.I. (misidentification of *S. albifrontella* Heinemann, 1870).

Syncopacma sp. 1 – Elsner et al. 1999: 52, Farbtaf. 25; Taf. 25, Abb. 306.

Material. Holotype ♂, “Prater” | “Col. Led[erer].” | “ex collect. Staudinger” | “azosterella” | “Genitalpräparat No. 1042 det. J. Klimesch, Linz” | “Holotype” (ZMHU). **France**, Alpes-Maritimes, Domaine de Maure Vieil: 1♂ 26.iv.1999, gen. slide Hendriksen 2462, 3♀ 2–3.vi.2000, gen. slide Hendriksen 2680, leg. H. Hendriksen (ZMUC). **Greece**: Lakonia, 5 km S Monemvasia, 2♀ 8.viii.1979, 1♀ 15.ix.1979, 1♀ 6.vii.1980, 1♀ 13.vi.1981, 1♀, 24.vi.1981, 1♀ 18.viii.1982, 1♀ 26.viii.1982, 1♂ 29.vi.1984, leg. G. Christensen; 2♂ 4.vii.1984, leg. B. Skule, gen. slide Hendriksen 4430; 7 km SW Monemvasia, 150 m, 1♀ 22.ix.1979, leg. G. Christensen, gen. slide Hendriksen 4431; 1♀ 9.iv.1981, leg. B. Skule; 1♀ 2.vii.1982, leg. S. Langemark & B. Skule; Prov. Serra, 20 km E Sidirokastro, Kapnophyton, 450 m, 1♂ 18.vii.1990, leg. M. Fibiger, gen. slide Hendriksen 1170; Ipiros, Konitsa area, below Smolikas, 700–1500 m, 1♂ 21–23.v.1994, leg. O. Karsholt, gen. slide Hendriksen 3615 (all ZMUC). **Hungary**, Veszprem County, 10 km N Veszprem: 47°10'N 17°58'E, 300 m, 2♂ 17.vii.2005, leg. C. Hviid, B. Skule & E. Vesterhede, gen. slide Hendriksen 6209 (ZMUC). **Morocco**, High Atlas Mts, Asni area: 1100–1400 m, 3♂, 3♀ la. 8–10.

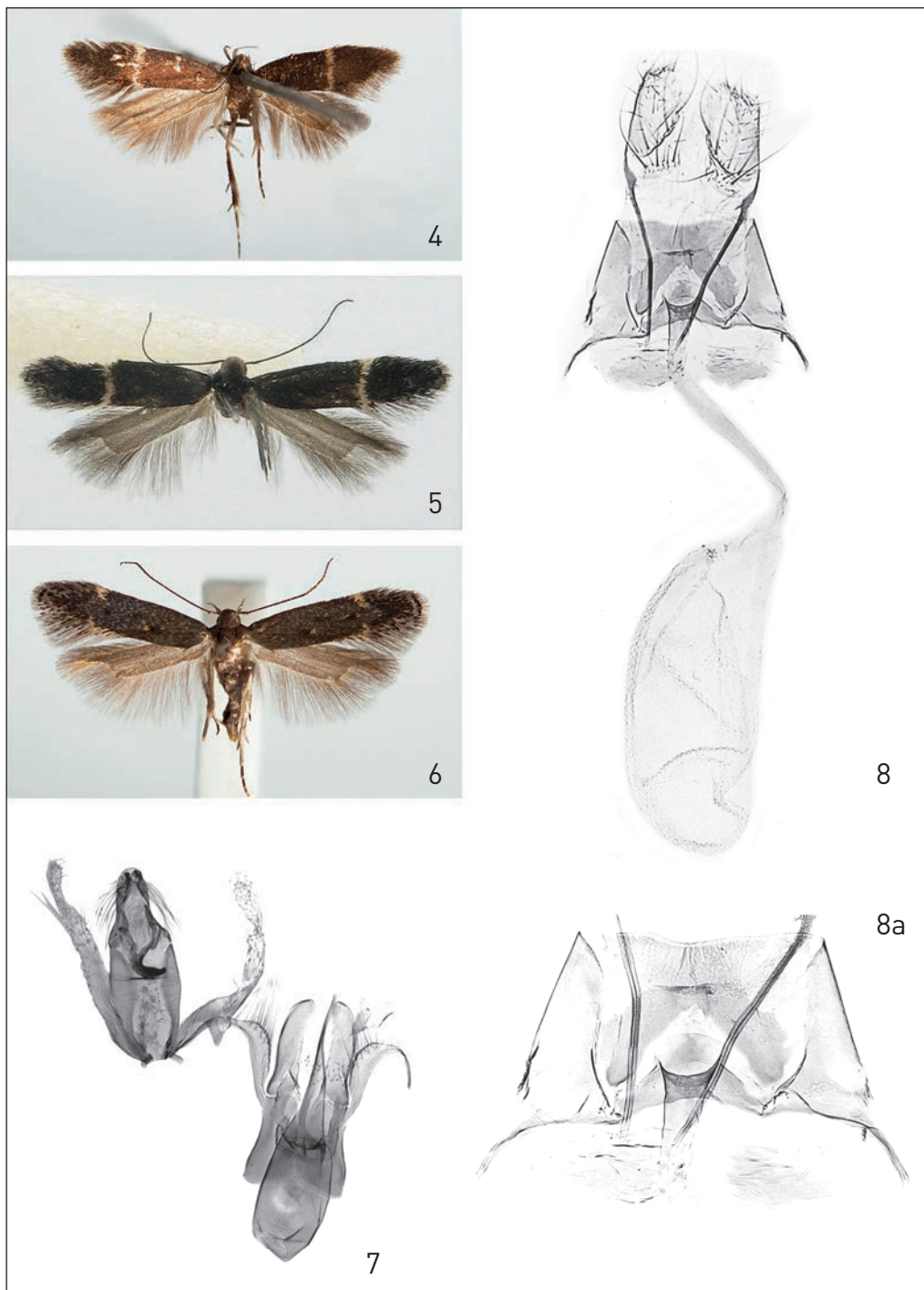
iv.1989, *Cytisus* sp., leg. O. Karsholt, gen. slide Hendriksen 4708 (ZMUC). **Romania**, Carpatii orientali, Cheile Bicazului, 1250 m: 1♂ 11–12.viii.1988, leg. & coll. S. & Z. Kovács. **Slovenia**, SW part, 11 km above Kozina, Stavnik Mts, 45°32'N 13°58'E, 950 m: 1♂ 30.vi. 2003, C. Hviid & B. Skule, gen. slide Hendriksen 4876 (ZMUC). **Spain**: Prov. Segovia, San Ildefonso, no date, 1♂, 2♀, gen. slide Karsholt 5006; Prov. Málaga: Camino de Istan, 400 m, 1♀ 25.vi.1975, leg. E. Traugott-Olsen, gen. slide Hendriksen 4547; Sierra de Marbella, El Mirador, 700 m, 1♂ 19.viii.1977, leg. E. Traugott-Olsen, gen. slide Hendriksen 4549; Camino de Ronda, Urb. Madronal, Loma de Colmenas, 500 m, 1♀ 23.v.1986, gen. slide Hendriksen 5271; 1♂ 19.viii.1988, gen. slide Hendriksen 3749; 2♀ 28.vii.1988; 3♂, 1♀ 30.viii.1988, gen. slide Hendriksen 2390; 4♂, 3♀ 4.ix.1988; 2♂ 10.ix.1988; 1♂ 13.ix.1988, leg. E. Traugott-Olsen; Prov. Granada: 10 km NW Otivar, Lopera, 1200 m, 2♂ 24.vii.2003, leg. P. Skou, gen. slide Hendriksen 4677; 25 km N Almunecar, Moscaril, 500 m, 1♂ 28.viii–9.ix.2004, leg. G. Jeppesen, gen. slide Hendriksen 5089 (all ZMUC). **Ukraine**: Lugansk reg., Melovoi distr., Strel'tsovskaya Step Nat. Res., 2♂ 1♀ 10.vii.2002, at light, leg. A. Bidzilya, gen. slide 5/12; Donetsk reg., Kemennye Mogily Nat. Res., 1♀ 18.vii.1989, leg. A. Zhakov (ZMKU).

Redescription. A d u l t (Figs 4–6). Wingspan 9.5–13.5 mm. Head black, frons slightly lighter, dark-grey; labial palpus up-curved, segment 3 about 1.5 times narrower and nearly as long as segment 2, acute, light grey to white, underside black, segment 2 light grey; scapus black, flagellum black, underside white-ringed; thorax and tegulae black; forewing black, subapical fascia white, narrow; cilia grey, black-tipped; hindwing grey. For variation see below.

Male genitalia (Fig. 7). Uncus twice as long as broad, lateral folds densely setose, apex weakly rounded; gnathos hook stout, curved at nearly right angle in middle, apex tapered, curved; tegumen prolonged with well-developed lateral folds, pedunculi short, slender; valva nearly of equal width, slightly constricted before apex, exceeding apex of uncus; vinculum narrow, band-shaped, posterior-lateral margin bulging, bearing long hair-like setae; vincular projections moderately broad, outer margin evenly curved after half length, inner margin straight, apex weakly pointed; saccus sub-quadrangular, anterior margin weakly emarginated; phallus bulbous in basal half, distal half tapered, apical quarter needle-shaped.

Female genitalia (Figs 8, 8a). Papillae anales subovate, twice as long as wide, about as long as length of segment VIII, covered with short setae, a few long hair-like setae at base. Apophyses anteriores nearly four times shorter than apophyses posteriores and about 3 times shorter than segment VIII. Segment VIII slightly broader than long, trapezoidal, posterior margin nearly straight, anterior margin weakly concave in middle. Lateral folds of sternum VIII broadly separated by medial zone with well-developed Λ -shaped sclerotisation that reaches nearly to the anteromedial corners of these folds. Ostium opening near anterior margin of sternum VIII, posterior subostial sclerite semicircular, anterolateral sclerites joining anteromedial corners of the folds of sternum VIII. Antrum strongly sclerotised, posterior margin evenly concave with tapered posteriolateral corners. Ductus bursae slender, membranous, slightly narrowed near the entrance of corpus bursae. Corpus bursae weakly sclerotised, subovate, about as long as ductus bursae. Signum absent.

Biology. Early stages have not been described. The species has been reared from *Adenocarpus intermedius* DC. (Fabaceae) first by Mendes (1904) from São Fiel in Beira Baixa in Portugal, but it was identified as *Anacamptis vorticella* (Scopoli). According to Mendes (op cit.) the larva is common in March and April on *Adenocarpus*, tying the leaves into a bud-like form (M. Corley in litt.). A small series of moths were bred from



Figs 4–8. *Syncopacma azosterella* (Herrich-Schäffer). 4. Holotype, Austria, wingspan 12.5 mm. 5. Specimen from Ukraine, wingspan 11.1 mm. 6. Specimen from Morocco, wingspan 12.2 mm. 7. Male genitalia, Ukraine, gen. slide Bidzilya 5/12. 8. Female genitalia, France, gen. slide Karsholt 5006; a: segment VIII (enlarged).

larvae feeding on broom ('*Cytisus* sp.', Fabaceae) in the High Atlas Mts of Morocco. Adults have been collected from May to September, mostly at light, but in Bulgaria flying around *Genista* sp. (Junnilainen et al. 2010). The species has probably one generation in central Europe and two or three generations in the Mediterranean lowlands.

Distribution. Austria, Bulgaria (Junnilainen et al. 2010), Czech Republic (Elsner et al. 1999), France (new record), Greece (new record), Hungary, Morocco (new record), Romania, southern Ural in Russia (Junnilainen et al. 2010), Slovenia (new record), Spain (new record), Ukraine (new record). In Portugal (new record) *S. azosterella* is a locally common species feeding on *Adenocarpus*. Occasionally larvae may be quite numerous (M. Corley in litt.). Records from Switzerland (e.g., Gozmány 1957) are based on misidentification (SwissLepTeam 2010: 187). Records from Poland (e.g., Karsholt & Riedl 1996) probably date back to Rebel (1901: 154), but were not confirmed and are probably due to misidentification.

Remarks. *Anacampsis azosterella* was described from a single specimen collected by H. Lederer in Austria: Wien (Herrich-Schäffer 1854). The whereabouts of the holotype were unknown for a long time (Hering 1952: 206; Wolff 1958: 258), which made it impossible to correctly apply this name to any taxon. We were able to locate the holotype in the ZMHU but, unfortunately, the corresponding genitalia slide seems to be lost. The type is in rather good condition, although somewhat faded. That may have been the case already when Herrich-Schäffer described it, as he described the (white) subapical fascia as "etwas bräunlich" [somewhat brownish]. In the photograph (Fig. 4) the holotype specimen looks more broad-winged than the specimens shown in Figs 5–6, but that is because it does not have the wings spread to horizontal position. Comparing it to other old, faded specimens of *S. azosterella* gave an exact match. After its description *S. azosterella* remained a poorly known taxon, and it was only mentioned in a few publications. Gozmány (1957: 121) tried to solve the identity of *S. azosterella*, but he mixed it with *S. albifrontella* (Heinemann, 1870) and its synonym *S. ignobiliella* (Heinemann, 1870) (Wolff 1958: 258), causing further misidentifications of *S. azosterella* in the literature. Based on a preliminary study of the holotype, Karsholt & Riedl (1996: 119) reintroduced *S. azosterella* for the species dealt with here, although without an explanation, and that probably caused Elsner et al. (1999) to doubt its identity and treat the species as "*Syncopacma* sp. 1."

We have considered whether the holotype of *S. azosterella* could belong to another *Syncopacma* species, and one could argue that it might be either (a small) *S. cinctella* (Clerck, 1759) or *S. ochrofasciella* (Toll, 1936). However, the species dealt with here is a surprisingly variable species (see below) so it is difficult to argue that the holotype of *S. azosterella* does not belong here. We are, moreover, of the opinion that this solution serves the stability of nomenclature best. We have also considered the possibility of treating *Anacampsis azosterella* Herrich-Schäffer as a *species incertae sedis* and to give a new name to "*Syncopacma* sp. 1" of Elsner et al. (1999), but we prefer not to do so as we find that a less satisfactory solution.

S. azosterella is a variable species. Specimens from southern Greece and southern Spain are small (wingspan 7–11 mm), with the smallest specimens from the summer and autumn generations. They have a clear white subapical band on the forewing and

no black spots, and they also look more slender-winged. Specimens from central Spain (San Ildefonso) are larger (wingspan 11–13 mm) but otherwise similar. However, two specimens from southern Spain, prov. Granada (wingspan 11 mm) differ from other Spanish specimens examined in having almost black forewings with only a few lighter scales at the costa near the apex and at the tornus; moreover, they have black spots in the middle of the wing. These two specimens more closely resemble a series of reared specimens from Morocco (wingspan 11–13 mm), which have black spots in the fold and in the middle of the wing followed by a few light yellow scales, and a yellowish white subapical fascia interrupted in the middle.

The examined slides of male genitalia show slight variation, not just in size, but in the relative proportions of the length of the vincular projections and the saccus, and also of the basal, swollen part and the apical, thin part of the phallus. Furthermore, there are small differences in the shape of the phallus. However, we found no correlation between these small differences and the differences in forewing pattern described above. We therefore conclude that this variation is most probably due to differences in preparing the studied genitalia slides, and especially in the pressure put on the genitalia through the cover slip.

Most species of *Syncopacma* are more or less difficult to recognise from external characters, and it is often necessary to examine the genitalia to reach a safe identification. Fortunately, the male genitalia of most species exhibit characteristic differences (e.g., Elsner et al. 1999; Wolff 1958). As no such differences could be found between the more or less different looking populations studied by us, we here conclude, at least tentatively, that they belong to one variable species. Studies of the DNA from different populations may well contradict this, and especially specimens from Spain and Morocco, having an interrupted subapical fascia and black spots in the forewing, may well turn out to represent a distinct species.

S. azosterella may be confused externally with *S. cinctella* (Clerck, 1759) and other *Syncopacma* species with narrow white subapical fascia. The male genitalia of *S. azosterella* most resemble those of *S. suecicella* (Wolff, 1958) and *S. linella* (Chrétien, 1904), but differ from the first mentioned in the basal portion of the phallus being longer and in the absence of a prominent lateral vincular projection. *S. linella* differs in the apically pointed rather than rounded posterior vinculum projections as in *S. azosterella*. Δ -shaped sclerotisation on sternum VIII and semicircular posterior subostial sclerite are characteristic features of the female genitalia.

Acknowledgements

Yuriy I. Budashkin (Karadag Nature Reserve, Ukraine), Veronika O. Afanas'eva and Kyrlyo K. Holoborod'ko (Dnepropetrovsk State University, Ukraine), and Zoltan Kovacs (Miercurea Ciuc, Romania) provided material used in this study. Wolfram Mey assisted us during our work with the collection of ZMHU. Peter Huemer (Tiroler Landesmuseum, Innsbruck, Austria), Klaus Sattler (BMNH, London, UK) and Andreas Segerer (Zoologische Staatssammlung, München, Germany), helped with information. Leif Aarvik (Zoologisk Museum, Oslo, Norway) and Martin Corley (Faringdon, UK), commented on the manuscript, and the latter also improved the English language. We also received suggestions for improving the manuscript from Peter Huemer and an anonymous reviewer. Reinhard Sutter (Bitterfeld, Germany) provided the photograph for Fig. 8. We are grateful to all for their help.

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